

Material Safety Data Sheet

Battery Fluid, Acid (Electrolyte)

This Material Safety Data Information Sheet is principally directed to managerial, safety, hygiene and medical personnel. The description of physical chemical and toxicological properties and handling advice is based on experimental results and past experience. It is intended as a starting point for the development of health and safety procedures.

DOT LABELING REQUIREMENTS

Shipping Name: Battery fluid, acid
 Class: 8
 UN No.: UN2796

HAZARDOUS INGREDIENTS/IDENTITY

Sulfuric Acid - 66° Baume (Mineral Acid, Oil of Vitriol, H ₂ SO ₄ , sulfuric acid) WATER 40 CFR Part 372.45	OSHA PEL 1mg/M ³	ACGIH TLV 1mg/M ³	CAS NUMBER 7664-93-9	WEIGHT % 34-36
				64-66

Notification: Battery fluid, acid contains approximately 35% by weight of H₂SO₄ (CAS No. 7664-93-9) and is subject to the reporting requirements of section 313 of Title III of the superfund amendments and re-authorization act of 1986. It is also subject to the reporting requirements of 40 CFR part 372.

TOXICOLOGY DATA

Acute oral LD₅₀: 2,140 mg/kg in ratio, skin and eye irritation (rabbit): Corrosive inhalation 1 hour LC₅₀ Rat: 347 PPM

PHYSICAL & CHEMICAL CHARACTERISTICS

Formula: H₂SO₄
 Formula Weight: 98.08
 Physical State/Description: Clear, colorless liquid

HMIS RATINGS

Health	3
Flammability	0
Reactivity	2
Personal Protection	D

HAZARD INDEX

0 = Insignificant
 1 = Slight 2 = Moderate
 3 = High 4 = Extreme

Boiling Point: 35% = 275°F approximate
 Flash Point: Not applicable
 Freezing Point: 35% = -80°F (-62°C) approximate
 Odor: None
 pH: Less than 1 (1% aqueous solution)
 Specific Gravity: 35% = 1.265 (water = 1)
 Vapor Density: 3.4 (Air = 1 at boiling point of sulfuric acid)
 Vapor Pressure: 35% = Less than 1mmHg at 100°F (37.8°C)
 Water Solubility: Soluble in all proportions
 Reportable Quantity: 1,000 lb./454 kg. As H₂SO₄

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FIRE & EXPLOSION DATA

Flash Point:	N/A
Auto-Ignition Temperature:	N/A
Extinguisher Media:	Dry Chemical or CO ₂ small fires. Water fog, large fires.
Special Fire Fighting Procedures:	Do not direct water into acid tanks. Cool outside of tank with water. Wear full-face, self-contained respirator, rubberized outerwear, gloves, boots.
Unusual Fire and Explosive Hazards:	Sulfuric acid will not burn, but can start fires with organic material, nitrates, carbides, chlorates and metal powders. Flammable hydrogen gas can form when acid contacts most metals. Hydrogen may accumulate in containers, avoid ignition sources, spill over into sewers may generate hydrogen gas or toxic sulfides. Addition of water to acid causes heat and possible splattering.

PHYSICAL HAZARDS (REACTIVITY DATA)

Stability:	Stable
Conditions to Avoid:	Contact with metals, organics.
Incompatibility: (Materials to Avoid)	Strong corrosive agent will attack most metals. Contact with organics, nitrates, carbides, chlorates, etc. may cause ignition. Allyl compounds and aldehydes undergo polymerization – possibly violent.

Hazardous Decomposition Products:	Sulfur oxides at high temperature. Reacts with above to form hydrogen cyanide and hydrogen sulfide.
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Hazardous Polymerization:	Will not occur
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Conditions to Avoid:	All contact with organic substances and most metals.
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HEALTH HAZARDS

Acute:	3 rd degree burns. Severe respiratory, skin and eye irritant. Bronchitis laryngeal and pulmonary edema may result.
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Signs and Symptoms of Exposure:	Prickling or burning sensation of skin and mucous membranes. Coughing, sneezing, tightness of chest, difficulty breathing.
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Medical Conditions Generally Aggravated by Exposure:	Any pre-existing respiratory disease, for example emphysema.
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(continued)**

Chemical Listed as
Carcinogen or Potential
Carcinogen:

I.A.R.C. Monographs:

A limited study of refinery workers suggested a possible link between sulfuric acid exposure and laryngeal cancer. However, due to the small number of workers involved and the mixed exposure to several other materials including diethylsulfate (an I.A.R.C. and NTP carcinogen), there is no cause-and-effect relationship that can be inferred from the data available.

These studies have been conducted for various industries, but no studies of battery acid manufacturing facilities have been included. The overall weight of evidence from animal toxicity and human epidemiological studies show no relationship between cancer and sulfuric acid exposure.

National Toxicology
Program:

NO

OSHA:

NO

CAL/OSHA:

NO

Prop65:

NO

Emergency & First Aid
Procedures:

Speed in removing acid is essential. Treat most urgent symptoms first: cessation of breathing, eye injury, skin contact, shock. Seek medical assistance even if injury appears slight. Give physician detailed account of incident.

**RECOMMENDATIONS
TO PHYSICIAN**

While the patient is being transported to a medical facility, apply compresses of iced water. If medical treatment must be delayed, immerse the affected area in iced water. If immersion is not practical, compresses of iced water can be applied. Avoid freezing tissues.

Note to Physician:

Continued washing of the affected area with cold or iced water will be helpful in removing the last traces of sulfuric acid. Creams or ointments should not be applied before or during the washing phase of the treatment.

ROUTES OF ENTRY:

Inhalation:

Remove from exposure. CPR, if indicated. Give oxygen.

Eyes:

Flush immediately with large amounts of water for at least 15 minutes. Hold eyelids open during flushing.

Skin:

Flush immediately with large amounts of water. Remove contaminated clothing and shoes (this can be done while under shower).

Ingestion:

Do not induce vomiting. Give large amounts of milk, milk of magnesia or table oil or fresh eggs. Use water when nothing else is available. Rinse mouth often.

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ROUTES OF ENTRY (Continued)	Conditions Aggravated by:	Individuals with preexisting disease of the lungs may have increased susceptibility to the toxicity of excessive exposure.
SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES	Precautions to be Taken in Handling & Storage:	See "Unusual Fire and Explosion Hazards". Do not store near organics. Hydrogen may be generated inside drums and tanks; avoid flames and sparks.
	Other Precautions:	Never add water to containers of acid. For spills, beware of acid reaction in sewers that may produce flammable hydrogen gas or toxic sulfides.
	Steps to be Taken in Case Material is Released or Spilled:	Wear full acid-protective gear. Remove sources of ignition. Neutralize spill with lime or soda ash, flush to on-site wastewater treatment system. Dike large spills. Do not wash into storm or sanitary sewer system.
	Waste Disposal Methods (Consult Federal, State and Local Regulations):	Flush as above. Neutralize with lime or soda ash, (a minimum of 5.2 pounds soda ash per gallon of battery fluid, electrolyte). Consult regulations.
		EPA hazardous waste D002 – corrosive and D003 – reactive if discarded without prior neutralization.
SPECIAL PROTECTION INFORMATION/CONTROL MEASURES:	Respiratory Protection:	When needed use NIOSH or MSHA approved half or full-face mask with acid gas cartridge. For high concentrations, use self-contained breathing unit.
	Ventilation:	Required
	Local Exhaust:	Yes
	Mechanical:	Ventilate storage tanks before entry.
	Protective Gloves:	Rubber
	Eye Protection:	Chemical goggles or full-face shield
	Other Protective Clothing or Equipment:	Rubber safety shoes/boots. Rubber apron or full suit if splashes are likely.
	Work/Hygienic Practices:	Prohibit smoking. Provide safety showers/eye washes near work site. Train employees in chemical handling practices.
	Maintenance of Contaminated Equipment:	Use same precautions as in "Special Precautions" above.
	Labeling Priority:	Battery Fluid, Acid, 8, UN2796, Pg. II